

CLAIMS

1. Apparatus for use with a subject, comprising:
 - a catheter having a longitudinal axis and having a distal portion; and
 - an ultrasound array fixed to the distal portion, adapted to operate in a phased array mode to apply ablating energy to tissue of the subject located in a range of azimuths, with respect to the longitudinal axis,
10 that is less than 360 degrees.
2. The apparatus according to claim 1, wherein the ultrasound array comprises between about 32 and 64 ultrasound transducers.
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3. The apparatus according to claim 1, wherein the ultrasound array is adapted to apply the ablating energy to tissue in a range of azimuths between about 180 and 359 degrees.
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4. The apparatus according to claim 1, wherein when the catheter is disposed in a vicinity of an ostium of a pulmonary vein of the subject, the range of azimuths is sufficiently smaller than 360 degrees to avoid inducing a deficit in a phrenic nerve of the subject.
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5. The apparatus according to claim 1, comprising detection functionality, adapted to determine tissue of the subject that is not to be targeted by the ablating energy, wherein the ultrasound array is adapted to configures the ablating energy responsive to the
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determination of the tissue that is not to be targeted.

6. The apparatus according to claim 5, wherein the ultrasound array is adapted to set the range of azimuths
5 responsive to the determination of the tissue that is not to be targeted.

7. The apparatus according to claim 5, wherein the detection functionality comprises an ultrasound
10 transducer.

8. The apparatus according to claim 5, wherein the detection functionality comprises at least a portion of the ultrasound array.

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9. The apparatus according to claim 5, wherein the detection functionality comprises imaging functionality.

10. The apparatus according to claim 5, wherein the detection functionality is adapted to be fixed to the
20 distal portion of the catheter.

11. The apparatus according to claim 5, wherein the detection functionality is adapted to operate external to
25 a body of the subject.

12. A method for ablating tissue of a subject, comprising:

inserting an ultrasound array having an axis into a body of the subject, adjacent to the tissue; and

5 actuating the ultrasound array in a phased array mode to apply ablating ultrasound energy to the tissue in a range of azimuths, with respect to the axis, that is less than 360 degrees.

10 13. The method according to claim 12, wherein actuating the ultrasound array comprises applying the ablating ultrasound energy in a range of azimuths that is greater than 180 degrees.

15 14. The method according to claim 13, wherein actuating the ultrasound array comprises applying the ablating ultrasound energy in a range of azimuths that is greater than 270 degrees.

20 15. The method according to claim 12, wherein inserting the ultrasound array comprises placing the ultrasound array in a vicinity of an ostium of a pulmonary vein of the subject, and configuring the range of azimuths to be sufficiently smaller than 360 degrees to avoid inducing a deficit in a phrenic nerve of the subject.

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16. The method according to claim 12, wherein actuating the ultrasound array comprises:

30 determining tissue of the subject that is not to be targeted by the ablating energy; and

applying the ablating energy responsive to the determination of the tissue that is not to be targeted.

17. The method according to claim 16, wherein applying
5 the ablating energy comprises setting the range of azimuths responsive to the determination of the tissue that is not to be targeted.

18. The method according to claim 16, wherein determining the tissue that is not to be targeted comprises transmitting non-ablating ultrasound energy at the tissue that is not to be targeted.
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19. The method according to claim 18, wherein transmitting the non-ablating ultrasound energy comprises transmitting the non-ablating ultrasound energy from an ultrasound transducer in the ultrasound array.
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20. The method according to claim 16, wherein determining the tissue that is not to be targeted comprises imaging the tissue that is not to be targeted.
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21. The method according to claim 16, wherein determining the tissue comprises performing a measurement
25 in a vicinity of the ultrasound array.

22. The method according to claim 16, wherein determining the tissue comprises performing a measurement from a site external to a body of the subject.
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